Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-14. (Canceled)

15. (Currently Amended): A thermostable mutant polymerase comprising a Y-GG/A amino acid motif between an N-terminal 3'-5' exonuclease domain and a C-terminal polymerase domain wherein the tyrosine of the Y-GG/A amino acid motif is substituted with another amino acid, ~~wherein the mutant polymerase is suitable for polymerase chain reactions,~~ and wherein ~~the wild-type form of~~ the mutant polymerase has at least 80 % amino acid homology to SEQ ID NO:34.

16. (Canceled).

17. (Previously Added): The mutant polymerase of Claim 15 wherein the wild-type form of the mutant polymerase is obtainable from Euryarchaea.

18. (Previously Added): The mutant polymerase of Claim 15 wherein the wild-type form of the mutant polymerase is obtainable from *Thermococcus aggregans*.

19. (Currently Amended) The mutant polymerase of Claim 15 wherein ~~the wild-type form of the mutant polymerase is SEQ ID NO:34, and wherein~~ the difference between the mutant polymerase and SEQ ID NO:34 ~~the wild-type form~~ consists of the single amino acid substitution of the tyrosine of the Y-GG/A amino acid motif.

20. (Previously Added): The mutant polymerase of Claim 15 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an amino acid with an aromatic side chain.

21. (Previously Added): The mutant polymerase of Claim 20 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a phenylalanine, a tryptophan or a histidine.

22. (Previously Amended) The mutant polymerase of Claim 15 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an amino acid with a hydrophilic side chain.

23. (Previously Amended) The mutant polymerase of Claim 22 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an asparagine.

24. (Previously Added): A DNA encoding the mutant polymerase of Claim 15.

25. (Previously Added): A vector comprising the DNA of Claim 24.

26. (Previously Amended) An isolated host cell comprising the DNA of Claim 24 or the vector of Claim 25.

27. (Previously Amended) A process for obtaining a mutant polymerase comprising purifying the mutant polymerase from the isolated host cell of Claim 26.

28. (Previously Added): A process for synthesizing nucleic acids, comprising contacting the mutant polymerase of Claim 15 with nucleotides, a primer and a polynucleotide template under conditions suitable for elongation of the primer.

29. (Previously Added): A process for polynucleotide amplification comprising contacting the mutant polymerase of Claim 15 with nucleotides, primers and a polynucleotide template under conditions suitable for amplification of the polynucleotide.

30. (Previously presented) The mutant polymerase of Claim 21 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a tryptophan or a histidine.

31. (Previously presented) The mutant polymerase of Claim 22 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a serine.

32. (Previously presented) A polymerase chain reaction process comprising contacting the mutant polymerase of Claim 15 with nucleotides, a primer and a polynucleotide template under conditions suitable for amplification of the polynucleotide template.

33. (New) The mutant polymerase of Claim 15 wherein the difference between the mutant polymerase and wildtype polymerase consists of the single amino acid substitution of the tyrosine of the Y-GG/A amino acid motif, wherein the wildtype polymerase is a polymerase isolated from a bacterium selected from the group consisting of *Thermococcus aggregans*, *Thermococcus litoralis*, *Thermococcus gorgonarius*, *Thermococcus furioosus*, *Thermococcus*

spec. 9N7, *Pyrococcus abysii*, *Pyrococcus horikoshii*, *Pyrococcus* spec. KOD, and *Pyrococcus furiosus*.

34. (New) The mutant polymerase of claim 15, wherein the mutant polymerase amplifies λ phage DNA when 1 pmol of the mutant polymerase is included in an aqueous mixture comprising 10 mM Tris-HCl/pH8.9, 75 mM KCl, 1.5 mM $MgCl_2$, 10 mM CHAPS, 200 μM dNTP, 10 ng λ DNA and 30 pmol of each of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 and SEQ ID NO:13 and exposed to the following amplification conditions: 2 minutes at 94°C, 10 cycles with 10 seconds at 94°C, 30 seconds at 58°C and 3 minutes at 72°C followed by 20 cycles with 10 seconds at 94°C, 30 seconds at 58°C and 3 minutes elongation at 72°C increased by 20 seconds/cycle followed by 7 minutes at 72°C.